

Application No. 09/938,280

AMENDMENTS TO THE CLAIMS

A detailed listing of all claims that are, or were, in the present application, irrespective of whether the claim(s) remains under examination in the application are presented below. The claims are presented in ascending order and each includes one status identifier. Those claims not cancelled or withdrawn but amended by the current amendment utilize the following notations for amendment: 1. deleted matter is shown by strikethrough for six or more characters and double brackets for five or less characters; and 2. added matter is shown by underlining.

1. (Currently Amended) A door closer that holds a door at a fully closed position by engaging with a prescribed engagement member, wherein, when the engagement member is disengaged from the door closer, the door moves to a released position that is located slightly separate from the fully closed position in a door opening direction, the door closer comprising:

a latch, which engages with the engagement member, wherein the latch rotates between an initial position at which the latch receives the engagement member and a fully latched position, and wherein, when the latch rotates from the initial position to the fully latched position after receiving the engagement member, the door is moved to the fully closed position;

an urging member, which urges the latch toward the initial position;

a ratchet lever action pawl, which is urged toward the latch, wherein, when the latch reaches the fully latched position, the ratchet lever action pawl engages with the latch to hold the latch at the fully latched position;

an actuation mechanism, which separates the ratchet lever action pawl from the latch to disengage the ratchet lever action pawl from the latch, wherein, when the ratchet

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lever action pawl disengages from the latch, the urging member returns the latch from the fully latched position to the initial position such that the engagement member disengages from the latch and the door moves from the fully closed position to the released position;

a courtesy switch, which detects that the door is located at a predetermined position separate from the released position in the door opening direction, the courtesy switch controlling the action of the ratchet lever action pawl through the actuation mechanism, wherein the courtesy switch commands the actuation mechanism to hold the ratchet lever action pawl at a position at which the ratchet lever action pawl cannot engage with the latch after the ratchet lever action pawl disengages from the latch, unless the courtesy switch detects that the door is located at the predetermined position;

a motor, which drives the actuation mechanism; and

a controller, which controls the motor, said controller containing a timer having a settable reference time for latching operations, which when exceeded causes said motor to run in an inverse direction to reverse the latching operation.

2. (Cancelled)

3. (Previously Presented) The door closer as set forth in Claim 1, wherein the controller maintains the motor in a stopped state after the ratchet lever action pawl disengages from the latch, unless the courtesy switch detects that the door is located at the predetermined position.

4. (Previously Presented) The door closer as set forth in Claim 1, wherein the controller controls the motor such that the actuation mechanism disengages the ratchet lever action pawl from the latch in accordance with an external instruction.

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5. (Original) The door closer as set forth in claim 1, wherein:

the latch rotates from the initial position to the fully latched position via a latching start position;

the ratchet lever action pawl is a first ratchet lever action pawl;

the door closer further includes a second ratchet lever action pawl, which is urged toward the latch, wherein the second ratchet lever action pawl engages with the latch when the latch reaches the latching start position from the initial position; and

the actuation mechanism moves the second ratchet lever action pawl such that the second ratchet lever action pawl rotates the latch to the fully latched position when the second ratchet lever action pawl engages with the latch.

6. (Previously Presented) The door closer as set forth in Claim 1, wherein:

the latch rotates from the initial position to the fully latched position via a latching start position;

the ratchet lever action pawl is a first ratchet lever action pawl;

the door closer further includes a second ratchet lever action pawl, which is urged toward the latch, wherein the second ratchet lever action pawl engages with the latch when the latch reaches the latching start position from the initial position; and

the controller instructs the actuation mechanism to move the second ratchet lever action pawl such that the second ratchet lever action pawl rotates the latch to the fully latched position when the second ratchet lever action pawl engages with the latch.

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7. (Original) The door closer as set forth in claim 6, wherein the controller controls the motor such that the actuation mechanism disengages the second ratchet lever action pawl from the latch in accordance with an external instruction.
8. (Previously Presented) The door closer as set forth in Claim 1, wherein the actuation mechanism includes a rotary body driven by the motor and a rotational position sensor that detects a rotational position of the rotary body, and the controller controls the motor in accordance with the rotational position of the rotary body detected by the rotational position sensor.
9. (Original) The door closer as set forth in claim 8, wherein the rotational position sensor includes a conductor that is located on the rotary body to form a predetermined conductive pattern on the rotary body and a plurality of contact elements that contact the conductive pattern, and the controller determines the rotational position of the rotary body in accordance with signals from the contact elements.
10. (Previously Presented) The door closer as set forth in claim 1, wherein the courtesy switch is a contact type switch.
11. (Currently Amended) A door closer that holds a door at a fully closed position by engaging with a prescribed engagement member, wherein, when the engagement member is disengaged from the door closer, the door moves to a released position that is located slightly separate from the fully closed position in a door opening direction, the door closer comprising:

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a latch, which engages with the engagement member, wherein the latch rotates between an initial position at which the latch receives the engagement member and a fully latched position, and wherein, when the latch rotates from the initial position to the fully latched position after receiving the engagement member, the door is moved to the fully closed position;

an urging member, which urges the latch toward the initial position;

a ratchet lever action pawl, which is urged toward the latch, wherein, when the latch reaches the fully latched position, the ratchet lever action pawl engages with the latch to hold the latch at the fully latched position;

an actuation mechanism, which separates the ratchet lever action pawl from the latch to disengage the ratchet lever action pawl from the latch, wherein, when the ratchet lever action pawl disengages from the latch, the urging member returns the latch from the fully latched position to the initial position such that the engagement member disengages from the latch and the door moves from the fully closed position to the released position;

a motor, which drives the actuation mechanism;

a controller, which controls the motor, said controller containing a timer having a settable reference time for latching operations, which when exceeded causes said motor to run in an inverse direction to reverse the latching operation; and

a courtesy switch, which detects that the door is located at a predetermined position separate from the released position in the door opening direction, the courtesy switch controlling the action of the ratchet lever action pawl through the actuation mechanism, wherein the controller maintains the motor in a stopped state such that the

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courtesy switch commands the actuation mechanism to hold the ratchet lever action pawl at a position at which the ratchet lever action pawl cannot engage with the latch after the ratchet lever action pawl disengages from the latch, unless the courtesy switch detects that the door is located at the predetermined position.

12. (Original) The door closer as set forth in claim 11, wherein the controller controls the motor such that the actuation mechanism disengages the ratchet lever action pawl from the latch in accordance with an external instruction.
13. (Original) The door closer as set forth in claim 11, wherein the actuation mechanism includes a rotary body driven by the motor and a rotational position sensor that detects a rotational position of the rotary body, and the controller controls the motor in accordance with the rotational position of the rotary body detected by the rotational position sensor.
14. (Original) The door closer as set forth in claim 13, wherein the rotational position sensor includes a conductor that is located on the rotary body to form a predetermined conductive pattern on the rotary body and a plurality of contact elements that contact the conductive pattern, and the controller determines the rotational position of the rotary body in accordance with signals from the contact elements.
15. (Previously Presented) The door closer as set forth in claim 11, wherein the courtesy switch is a contact type switch.

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16. (Currently Amended) A door closer that holds a door at a fully closed position by engaging with a prescribed engagement member, wherein, when the engagement member is disengaged from the door closer, the door moves to a released position that is located slightly separate from the fully closed position in a door opening direction, the door closer comprising:

a latch, which engages with the engagement member, wherein the latch rotates between an initial position at which the latch receives the engagement member and a fully latched position, and wherein, when the latch rotates from the initial position to the fully latched position via a latching start position between the initial position and the fully latched position after receiving the engagement member, the door moves to the fully closed position;

an urging member, which urges the latch toward the initial position;

a latching ratchet lever action pawl, which is urged toward the latch, wherein, when the latch reaches the latching start position from the initial position, the latching ratchet lever action pawl engages with the latch to rotate the latch to the fully latched position;

a holding ratchet lever action pawl, which is urged toward the latch, wherein, when the latch reaches the fully latched position, the holding ratchet lever action pawl engages with the latch to hold the latch at the fully latched position;

an actuation mechanism, which separates the latching ratchet lever action pawl and the holding ratchet lever action pawl from the latch to disengage the ratchet lever action pawls from the latch, wherein, when the ratchet lever action pawls disengage from the latch, the urging member returns the latch from the fully latched position to the initial

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position such that the engagement member disengages from the latch and the door moves from the fully closed position to the released position;

a motor, which drives the actuation mechanism;

a controller, which controls the motor, said controller containing a timer having a settable reference time for latching operations, which when exceeded causes said motor to run in an inverse direction to reverse the latching operation; and

a courtesy switch, which detects that the door is located at a predetermined position separate from the released position in the door opening direction, the courtesy switch controlling the action of the ratchet lever action pawl through the actuation mechanism, wherein the controller maintains the motor in a stopped state such that the courtesy switch commands the actuation mechanism to hold each ratchet lever action pawl at a position at which the ratchet lever action pawl cannot engage with the latch after the ratchet lever action pawls disengage from the latch, unless the courtesy switch detects that the door is located at the predetermined position.

17. (Previously Presented) The door closer as set forth in Claim 1, further comprising a Positive Temperature Coefficient thermistor, which is a protective element.

18. (Previously Presented) The door closer as set forth in Claim 11, further comprising a Positive Temperature Coefficient thermistor, which is a protective element.

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19. (Previously Presented) The door closer as set forth in Claim 16, further comprising a Positive Temperature Coefficient thermistor, which is a protective element.

20. (Currently Amended) A door closer that holds a door at a fully closed position by engaging with a prescribed engagement member, wherein, when the engagement member is disengaged from the door closer, the door moves to a released position that is located slightly separate from the fully closed position in a door opening direction, the door closer comprising:

a latch, which engages with the engagement member, wherein the latch rotates between an initial position at which the latch receives the engagement member and a fully latched position, and wherein, when the latch rotates from the initial position to the fully latched position after receiving the engagement member, the door is moved to the fully closed position;

an urging member, which urges the latch toward the initial position;
a ratchet lever action pawl, which is urged toward the latch, wherein, when the latch reaches the fully latched position, the ratchet lever action pawl engages with the latch to hold the latch at the fully latched position;

an actuation mechanism, which separates the ratchet lever action pawl from the latch to disengage the ratchet lever action pawl from the latch, wherein, when the ratchet lever action pawl disengages from the latch, the urging member returns the latch from the fully latched position to the initial position such that the engagement member disengages from the latch and the door moves from the fully closed position to the released position; and

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a courtesy switch, which detects that the door is located at a predetermined position separate from the released position in the door opening direction, the courtesy switch controlling the action of the ratchet lever action pawl through the actuation mechanism, wherein the courtesy switch commands the actuation mechanism to hold the ratchet lever action pawl at a position at which the ratchet lever action pawl cannot engage with the latch after the ratchet lever action pawl disengages from the latch, unless the courtesy switch detects that the door is located at the predetermined position.